



# Seattle Transit Master Plan

*Seattle City Council Transportation Committee Briefing*

*July 26, 2011*



**Seattle  
Department of  
Transportation**



In Association with:  
URS Corporation  
SVR  
DKS Associates  
The Underhill Company

# Presentation Overview

- Framing analysis results
  - TMP goals and outcomes
  - Plan elements and progress
  - Corridor analysis findings
  - Long-range high capacity transit network
- Bus priority corridors approach
- High capacity candidate corridor analysis



# *Framing Analysis Results*

# Transit Master Plan Goals

- Make it easier and more desirable for people to take transit
- Respond to the needs of vulnerable populations
- Meet sustainability, growth management, and economic goals
- Create great places where modes connect
- Advance implementation within constraints



# Planning Outcomes

- Inform policy makers of the value of major transit investments
- Position the City to seek capital grant funding (inform next phase of study)
- Set a long-term direction for local transit development



*Eugene has chosen BRT as a primary mode*



*Portland has chosen rail as a focus of system development*

# Plan Elements and Progress

☑ – *Completed*  
P – *In Progress*

Goal setting	☑
Existing conditions and gaps	☑
Identify priority transit corridors (Top 15)	☑
Identify high capacity transit (HCT) corridors	☑
Define long-range HCT network	☑
Projects and implementation priority for bus corridors	P
Projects, mode, and phasing for HCT priority corridors	P
Service design and operations guidance	P
Facility improvements	P
Programs to develop ridership	P
Performance monitoring	P



# Corridor Analysis Findings

- Evaluation identified four HCT candidate corridors
- HCT corridors are a step toward long-range HCT network



# Long-Range HCT Network

- 40-50 year view
- Designed to make transit a best option for most trips
  - High frequency
  - Speed
  - Separation from traffic
  - Connect at great places or nodes

This map illustrates a long-range vision for the development of a top quality network of transit corridors that will carry high volumes of travelers, operate at speeds competitive with any other mode, run on facilities that allow high levels of reliability and protection from traffic congestion, and are connected by hubs that are great places for people.



# ***Bus Priority Corridors Approach***



# Bus Corridor Toolbox: What is Seattle Doing?



*Bus boarding island*



*Bus bulb*



*Business access transit lanes*



*Bus-only signal*

# Bus Corridor Toolbox: What is Next?



*Off-board fare payment*



*Raised bus boarding platform – designated loading zones*



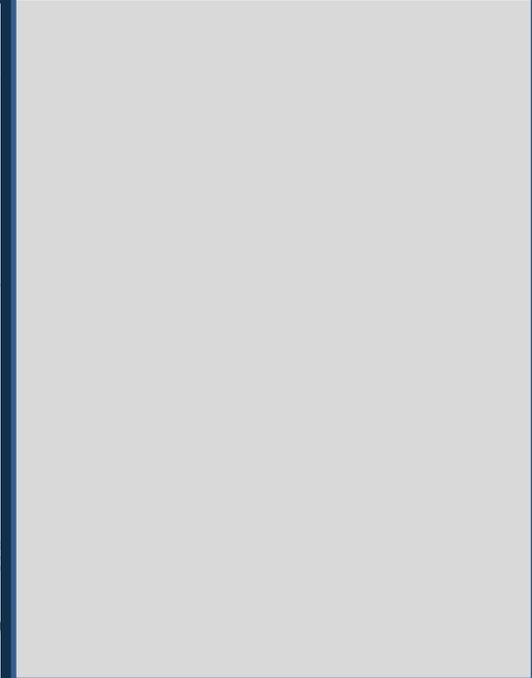
*Contraflow bus lane and double bike lanes*



*Innovative bus-bike treatments – colored bike lanes through transit center*

# CORRIDOR 2

## WHITE CENTER - DELRIDGE - DOWNTOWN SEATTLE



**Legend**

- Corridor Alignment
- Other Evaluated Corridors
- ST Link Light Rail / Stations
- KCM Bus Routes

**Daily Boarding Counts (Fall 2009)**

- 0 - 50
- 51 - 100
- 100 or more
- Toward Center City
- Away from Center City

*Notes: Includes bus stops on the corridor alignment only*

**Proposed Improvements**

- CE Curb Extensions
- SP Transit Signal Priority
- Queue Jump Lanes

# CORRIDOR 2

## WHITE CENTER - DELRIDGE - DOWNTOWN SEATTLE

- Bus priority and HCT metrics help to determine best potential mix of investments

### Ridership

Weekday Riders (2030)



up to 6,600 Riders

Net New Riders



up to 1,000 New Riders

### Productivity

2030 Weekday Riders per Revenue Service Hour



50 Riders per Hour

### Operating Costs

Annual Operating Costs



\$5 million

Operating Cost per Ride



\$2.50 per Ride

### Capital Costs

Non-Vehicle Capital Costs



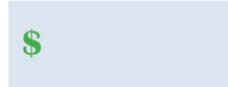
\$1 million

Annualized<sup>1</sup> Capital Costs per Net New Rider



\$35 per New Rider

Capital Costs per Mile<sup>2</sup>



\$135,000 per mile

### Travel Time Savings

Estimated End-to-End Travel Time Savings from Capital Improvements per Direction<sup>2</sup>



1.7 minutes

# Center City Bus Priorities

- 3<sup>rd</sup> Avenue transit spine improvements
- Yesler electrification
- Denny electrification and bus corridor enhancements
- South Lake Union transit center



**Modes to be Evaluated**

Rail/ Rapid Streetcar	Bus Rapid Transit	Rapid Bus	Frequent Bus
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

— Link Rail Rapid Network  
 — Frequent Streetcar (Existing Planned, Candidate)  
 — Transit Spine  
 — Linear Circulation (No Turns)  
 — Stations

# *High Capacity Candidate Corridor Analysis*

# HCT Candidate Corridors

- **8:** Roosevelt – U-District – SLU – Downtown
- **11:** Ballard – Fremont – SLU – Downtown
- **6:** Madison – Capitol/First Hill – Downtown – Colman Dock
- **CC1 & CC2:** Downtown connectors



# What is a Transit Mode?

- Mode is distinguished by more than its vehicle
  - Right-of-way design and management
  - Service characteristics (e.g., frequency, span of service, reliability)
  - Stations
  - Vehicles
  - Fare collection
  - Infrastructure
  - Technology

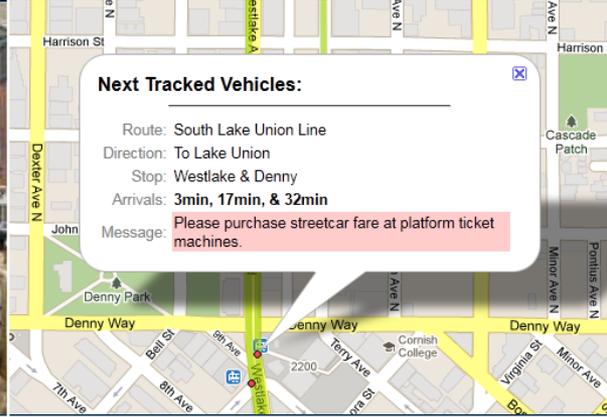


# Components of a Mode

## Right of Way



## Service Characteristics



## Station/Stop Spacing



## Vehicles



## Infrastructure/Technology



## Fare Collection



# Selecting a Preferred Mode

- Customers most value speed and reliability
- With high level of ROW prioritization, bus and rail can both deliver speed and reliability



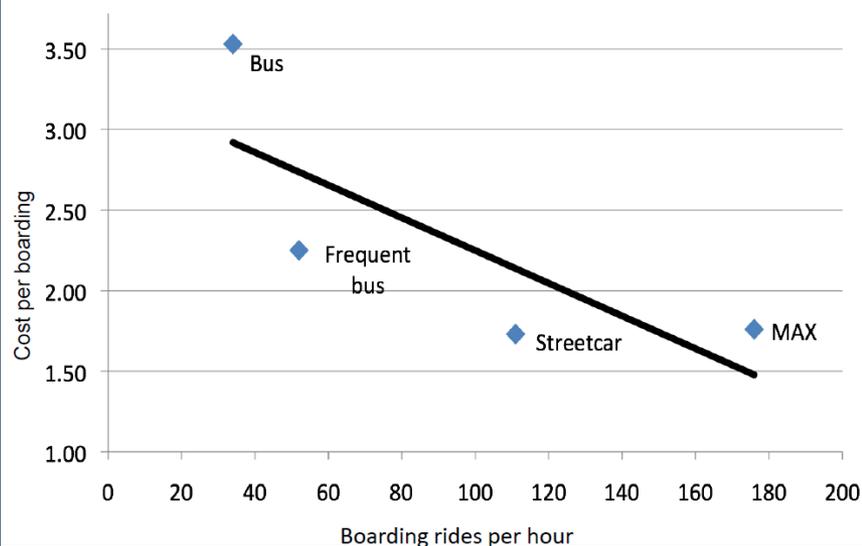
# Selecting a Preferred Mode

## *Differentiating Measures*

- Performance
  - ➔ – Ridership
  - GhG emissions reduction
- Value
  - ➔ – Cost per new rider gained (capital and operating)
  - Ability to leverage economic development (capacity)
- Quality
  - Comfort and ride quality
  - Contribution to placemaking



TriMet (Portland) Cost Per Ride By Mode



# CORRIDOR 6

## CAPITOL HILL-DOWNTOWN



- Rail capacity merited, but not feasible
- No net new operating cost
- Opportunity to leverage trolley bus replacement for e-BRT

### Weekday Riders (2030)

BRT



**up to 14,000 Riders**  
(Net New Riders - 6,200 Riders)

Enhanced Bus



**up to 12,500 Riders**  
(Net New Riders - 4,500 Riders)

### Operating Cost per Boarding Ride

BRT



**\$1.05**

Enhanced Bus

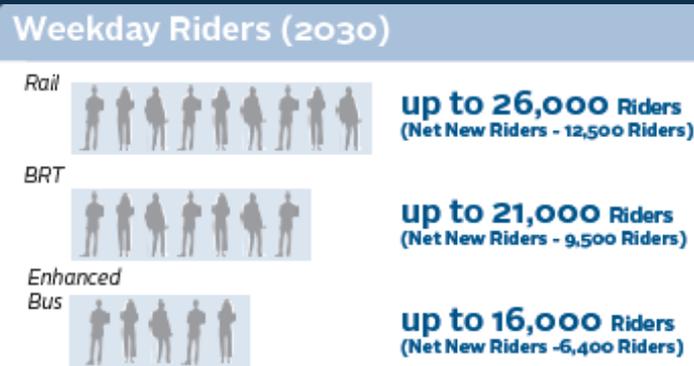
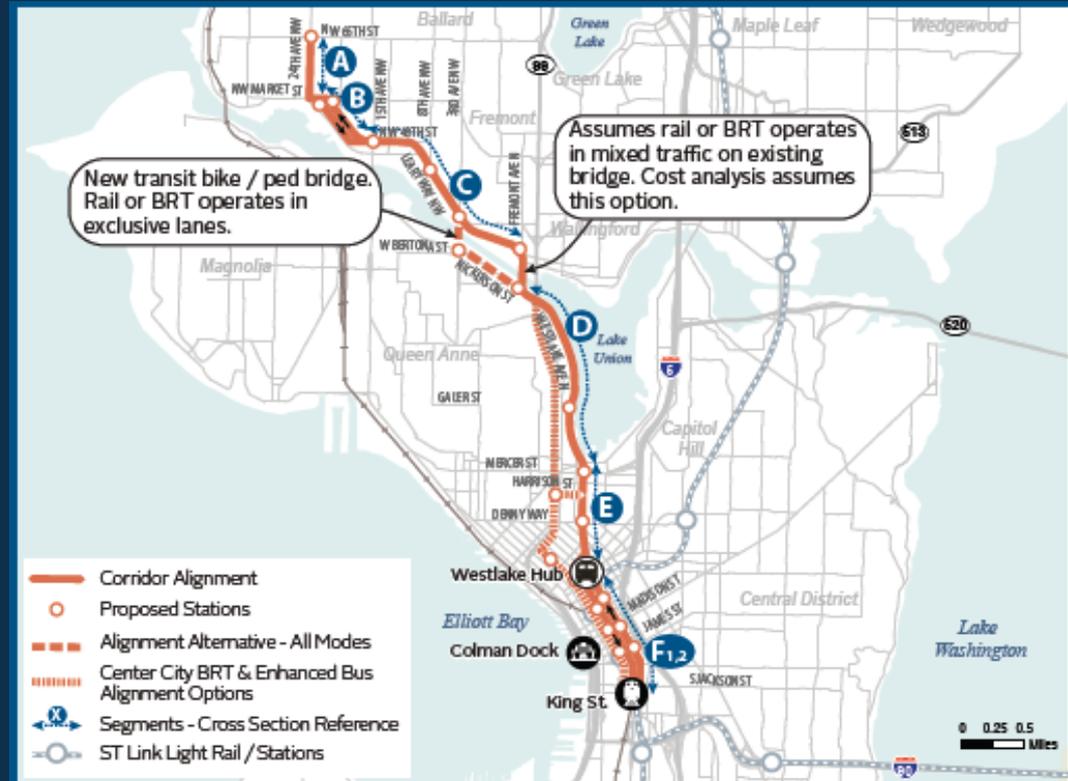


**\$1.70**

# CORRIDOR 11

## LOYAL HEIGHTS-BALLARD-FREMONT-SOUTH LAKE UNION-DOWNTOWN

- Rail has potential to deliver ~20% more riders than BRT in 2030
- Corridor has more net new riders than any other
- Rail has lowest operating cost per net new rider



# CORRIDOR 11

## LOYAL HEIGHTS-BALLARD-FREMONT-SOUTH LAKE UNION-DOWNTOWN

- BRT capital cost is ~33% of rail capital cost
- Value (e.g., cost per increment of new ridership) is more telling than total cost
- Operating costs are born locally; capital can receive significant federal match

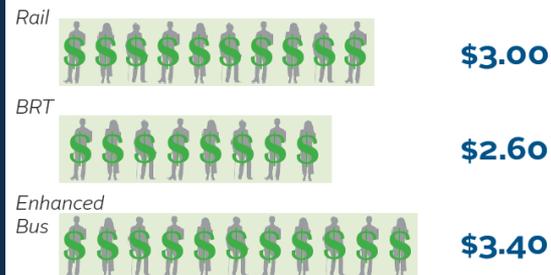
### Total Capital Costs (and Cost per Mile)



### Net Operating Cost per Net New Ride (Accounts for Service Restructuring and Consolidation Opportunities)



### Annualized Cost per Rider (Operating and Capital)

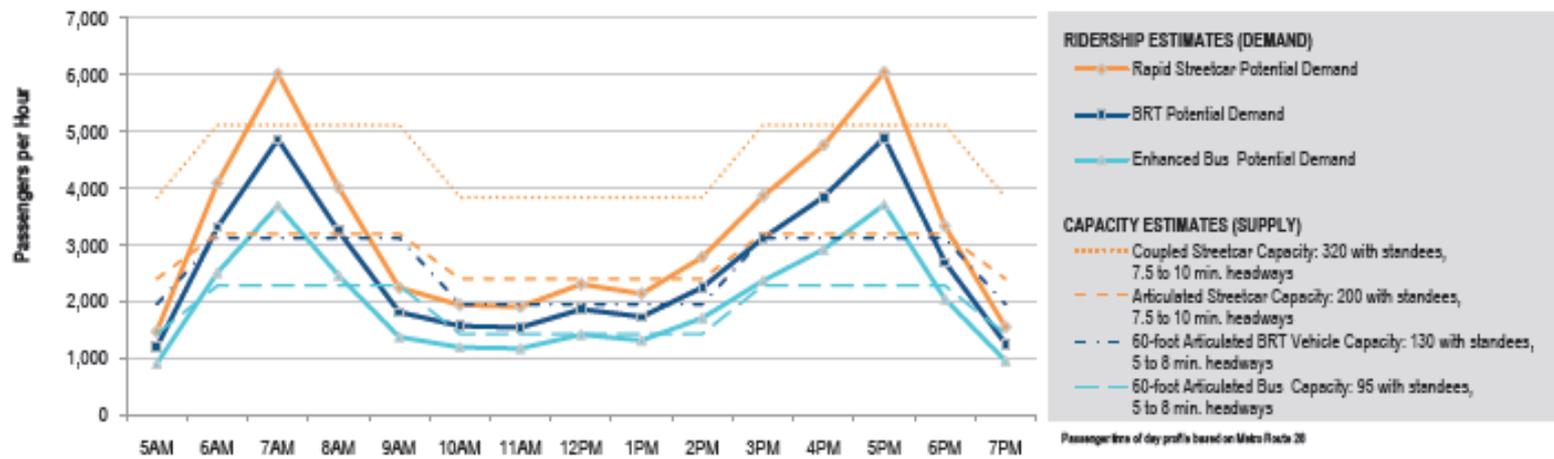


# CORRIDOR 11

LOYAL HEIGHTS-BALLARD-FREMONT-SOUTH LAKE UNION-DOWNTOWN

- Rail capacity merited in peak and midday
- Peak demand suggests need for extended streetcar vehicles

Vehicle Capacity Requirement (Estimated Bidirectional Demand by Mode vs. Capacity by Vehicle Type)



Siemens – Combino Supra

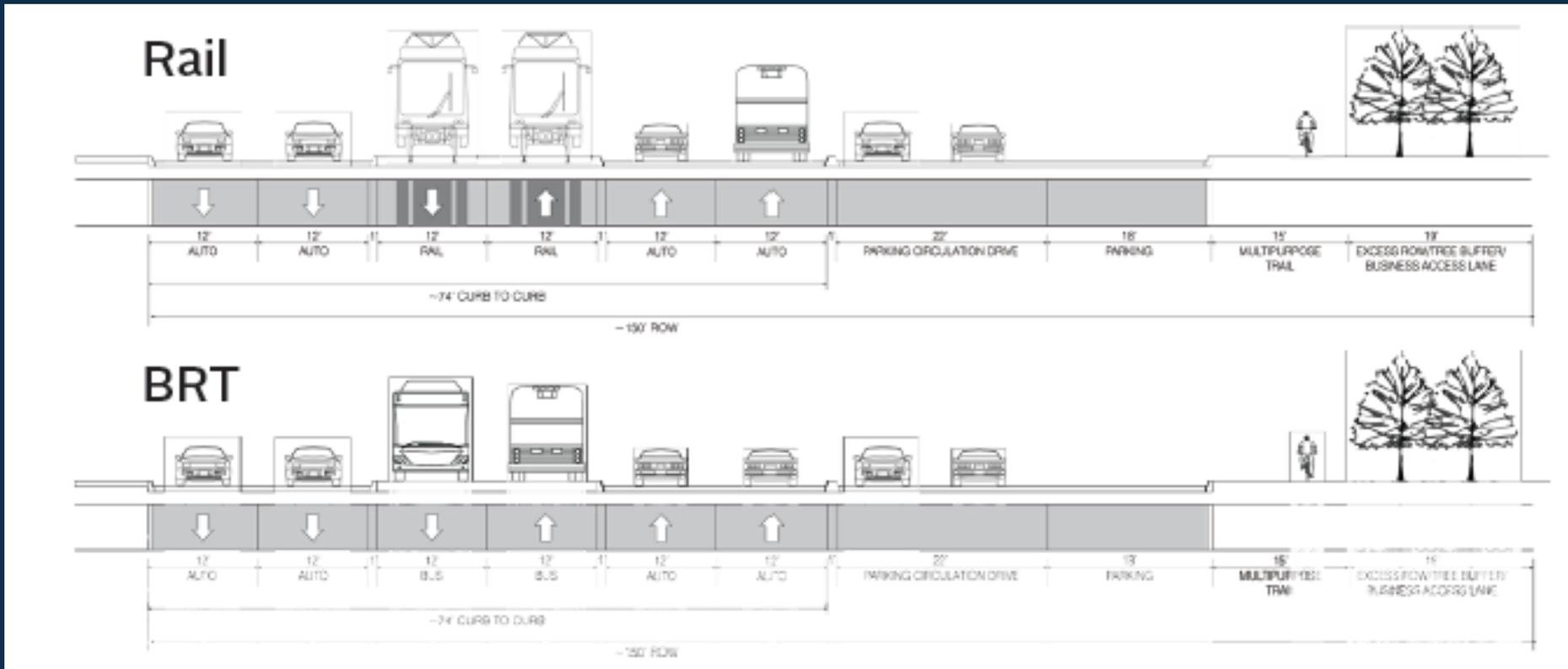


Alston – Citadis

# CORRIDOR 11

LOYAL HEIGHTS-BALLARD-FREMONT-SOUTH LAKE UNION-DOWNTOWN

- Westlake provides opportunity for fully dedicated running way



# CORRIDOR 11

## LOYAL HEIGHTS-BALLARD-FREMONT-SOUTH LAKE UNION-DOWNTOWN

Mode Decision Factors	Rail	BRT	Enhanced Bus
<b>PERFORMANCE</b>			
Ridership	☑☑☑	☑☑	☑
GhG Emissions Reduction	☑☑	☑☑	☑
<b>VALUE</b>			
Operating cost per net new rider	☑☑☑	☑☑	☑
Total annualized cost per new rider (capital and operating)	☑☑	☑☑☑	☑☑
Ability to leverage economic development	☑☑☑	☑☑	☑
<b>QUALITY</b>			
Comfort and ride quality	☑☑☑	☑☑	☑
Placemaking benefit	☑☑☑	☑☑	

# CC1

## LOWER QUEEN ANNE - DOWNTOWN

# CC2

## SOUTH LAKE UNION - DOWNTOWN

- Rail is preferred mode for “Downtown connector” options
- CC1 and CC2 should not be viewed as exclusive options; they serve different markets
- Connecting SLU and First Hill Streetcars can be part of the Center City network



# *Next Steps*

# Upcoming Council Discussions

- **September 13:**  
Executive Summary, modal recommendations, design standards
- **September 27:**  
Draft TMP complete, community outreach plan

